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Marshall Star, October 5, 2011 Edition

MARSHALL STAR

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NASA Deputy Administrator Garver Visits Huntsville to Talk Space Launch System

By Rick Smith

NASA Deputy Administrator Lori Garver spent a packed day in Huntsville Sept. 29, welcoming attendees to the agency's Space Launch System Industry Day event and talking to the Marshall Space Flight Center workforce and members of the local media about Marshall's leadership role in developing [NASA's new heavy-lift launch vehicle](#).

Image right: NASA Deputy Administrator Lori Garver welcomes industry leaders and stakeholders to the Space Launch System Industry Day Sept. 29 at the Davidson Center for Space Exploration in Huntsville. (MSFC/Emmett Given)



"This is a watershed moment for NASA," Garver told the Industry Day audience, which included more than 500 executives and managers of large and small businesses across the Southeast United States. "It isn't every day you literally get to begin

a program that will take us where no one has gone before.

"This is a great day for Marshall -- but also a milestone for all of NASA, for our industry partners and for our nation's economy," she added.

During the event, Space Launch System Program Manager Todd May and other Marshall project and procurement leaders outlined the acquisition strategy and implementation plan for [the new heavy-lift launcher](#). The event was held during Marshall's quarterly Small Business Alliance Meeting at the Davidson Center for Space Exploration in Huntsville.

Expectations for the new rocket development effort are high, Garver said, and successfully reaching its planned first test-flight in 2017 will take continued hard work and commitment from the NASA team and its partners.

"We will harness the American spirit of innovation, the drive to solve problems and create capabilities that is so embedded in our story," she said.



After her Industry Day address, Garver met with a half-dozen representatives of Huntsville-area media outlets, and told them Marshall and Huntsville are "the right home" for management of the new launch vehicle development program. She also praised NASA's academic and industry partners, saying their involvement is critical.

Image left: U.S. Rep. Mo Brooks of Alabama's 5th District, left, chats with Marshall Center Director Robert Lightfoot, center, and NASA Deputy Administrator Lori Garver during the Sept. 29 Industry Day event. (MSFC/Emmett Given)

"Without our partners, we won't be able to do this," she said. "We learn a lot from these partnerships. It's a very healthy relationship."

That afternoon, she joined Marshall Center Director Robert Lightfoot to talk with center team members about the Space Launch System development effort and its place in NASA's ongoing mission of exploration.

"We're counting on you," Garver told the crowd in Morris Auditorium in Building 4200. "Marshall has been leading the space program -- human spaceflight as well as the science side -- from Mercury, Gemini and Apollo all the way through the very successful shuttle program.

"The people here, and their experience, will make the Space Launch System a success," she added.

Garver stressed the agency's ongoing commitment to innovative scientific study on [the International Space Station](#), and praised the Marshall team for its continuing work on hardware and science projects supporting research on "this incredible laboratory," she said. She also said NASA remains committed to investing in high-value Earth science and space science missions -- including a variety of projects at Marshall.

She applauded the launch of the National Institute for Rocket Propulsion Systems, or NIRPS, in Huntsville (see second article in [the Aug. 24 edition of The Marshall Star](#)). Founded in August and led by the Marshall Center, the institute will support and unite NASA, government and industry propulsion system development capabilities to meet current and future

aerospace needs.

"NIRPS is the kind of thing that can draw together a nation's capabilities," she said. "We're happy to have that [here in Huntsville]."

Image right: NASA Deputy Administrator Lori Garver, right, answers a question from a Marshall team member during a Sept. 29 all-hands meeting while Marshall Center Director Robert Lightfoot looks on. (MSFC/Emmett Given)

Above all, Garver says NASA remains committed to its workers, and is in the process of reshaping itself to better make use of its talented labor pool.



"The federal workforce is where we believe we should be doing those cutting-edge things others cannot do," she told team members. "The hard thing. The new thing. The next thing."

That's where the Marshall Center thrives, she said.

Team members, to watch archived video of the Garver all hands, visit <http://desktoptv1.ndc.nasa.gov> and click on "Special Event" in the left column.

Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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Space Launch System, Procurement Leaders Pre-Brief Marshall Team in Preparation for Industry Day



Todd May, manager of the Space Launch System Program Office at the Marshall Space Flight Center, briefs the Marshall workforce about NASA's new heavy-lift launch vehicle development program during an all-hands meeting Sept. 28. May joined Marshall Center Director Robert Lightfoot and Earl Pendley, manager of the Space Transportation Support Office in Marshall's Office of Procurement, to explain program objectives, requirements and timelines and the acquisition strategy for current and future procurements tied to the Space Launch System development effort. (Amie Cotton)

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Aerospace Business Leaders Discuss Space Launch System -- Next U.S. Heavy-Lift Spacecraft -- at Industry Day Event

NASA news release

NASA leaders met Sept. 29 to discuss acquisition plans for the agency's new heavy-lift rocket with hundreds of representatives of aerospace industry companies, small businesses and independent entrepreneurs. The rocket, known as the Space Launch System (SLS), will take astronauts farther into space than ever before, create high-quality jobs here at home, and provide the cornerstone for America's future human space exploration efforts.

The Industry Day event, hosted by the Marshall Space Flight Center, provided industry representatives with an overview of the SLS Program and defined its near-term business requirements, including details of NASA's acquisition strategy for procurement of critical hardware, systems and vehicle elements.

Marshall is leading design and development of the Space Launch System for NASA.

"This is a milestone moment for NASA, for our industry partners and for our economy," NASA Deputy Administrator Lori Garver told the group. "We at NASA have worked hard the past year to analyze and select our Multi-Purpose Crew Vehicle and space launch systems designs."

Garver said, "The SLS heavy-lift rocket will take American astronauts farther into space than any human has ever gone before. It will expand our knowledge of the universe, reap benefits to improve life on Earth, inspire millions around the world and create good jobs right here at home."

"We're proud to be where we are today," said Marshall Center Director Robert Lightfoot. "We've done the due diligence necessary to get to this point -- thousands of configuration trades and studies -- and now it's time for us to start working on the hardware."

The event was held during Marshall's quarterly Small Business Alliance Meeting at the Davidson Center for Space Exploration, part of Huntsville's U.S. Space & Rocket Center.

NASA announced plans for the development of the SLS in September. It will carry NASA's Orion Multi-Purpose Crew Vehicle, cargo, equipment and science experiments to space -- providing a safe, affordable and sustainable means of reaching the moon, asteroids and other destinations in the solar system.

The planned vehicle will be the most powerful ever developed, evolving to a 130-metric-ton rocket built around a core stage, which will share common design, supplier base, avionics and advanced manufacturing techniques with the upper stage. It will use a liquid hydrogen and liquid oxygen propulsion system, relying on the space shuttle's RS-25 engine for the core stage and the J-2X engine for the upper stage. Dual, five-segment solid rocket boosters mounted to the sides of the tank will provide additional power. The design of the dual boosters on later flights will be determined through competition based on cost, performance and interface requirements.

The Space Launch System builds on the legacies of the Saturn rocket, space shuttle and Ares development efforts. It will take advantage of proven hardware and cutting-edge tooling and manufacturing technologies to significantly reduce development and operations costs. This strategy will help NASA maintain the development pace necessary to launch the first, full-scale test flight by late 2017.

For more information about SLS, click [here](#).

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By Janet Anderson

NASA has awarded the largest prize in aviation history, created to inspire the development of more fuel-efficient aircraft and spark the start of a new electric airplane industry. The technologies demonstrated by competitors in the CAFE Green Flight Challenge, sponsored by Google, may end up in general aviation aircraft -- spawning new jobs and new industries for the 21st century.

Image right: Pipistrel-USA team lead Jack Langelaan shows off the winning aircraft, the Taurus G4, on Oct. 3 at NASA's Ames Research Center. The all-electric airplane achieved the equivalency of more than 400 miles per gallon. (NASA/Bill Ingalls)



The first-place prize of \$1.35 million was awarded to team Pipistrel-USA.com of State College, Pa. The second-place prize of \$120,000 went to team eGenius of Ramona, Calif.

NASA's Centennial Challenges promote technical innovation through a novel program of prize competitions. The challenges are designed to tap the nation's ingenuity to make revolutionary advances in technology of value to NASA and the nation.

NASA's Office of the Chief Technologist in Washington and the Marshall Space Flight Center manage the prize program. The competition was managed by the Comparative Aircraft Flight Efficiency, or CAFE, Foundation under an agreement with NASA.

Fourteen teams originally registered for the competition. Three teams successfully met all requirements and competed Sept. 26-29 in the skies over the Charles M. Schulz Sonoma County Airport in Santa Rosa, Calif.

"NASA congratulates Pipistrel-USA.com for proving that ultra-efficient aviation is within our grasp," said Joe Parrish, NASA's acting chief technologist at NASA Headquarters in Washington. "Today we've shown that electric aircraft have moved beyond science fiction and are now in the realm of practice."

The winning aircraft had to fly 200 miles in less than two hours and use less than one gallon of fuel per occupant, or the equivalent in electricity. The first- and second-place aircraft, which were both electric-powered, achieved twice the fuel efficiency requirement of the competition, meaning they flew 200 miles using just over a half-gallon of fuel equivalent per passenger.

"Basically we are trying to make a Prius fly," said Sam Ortega, Centennial Challenges program manager.

This week's competition marks the culmination of more than two years of aircraft design, development and testing for the teams. It represents the dawn of a new era in efficient flight and is the first time that full-scale electric aircraft have performed in competition. Collectively, the competing teams invested more than \$4 million in pursuit of the challenge prize purse.

Learn more about NASA's Centennial Challenges [a here](#).

Anderson is a public affairs officer in the Office of Strategic Analysis & Communications.

Microgravity Science Glovebox Team Celebrates 10,000 Hours of Glovebox Operation

By Jessica Eagan



The [Microgravity Science Glovebox](#) team has reason to celebrate. On Sept. 13 at 7:45 p.m. CDT, the science facility hit 10,000 hours of operation, orbiting high above us on board the International Space Station.

Image left: The Microgravity Science Glovebox team sits on console at the Marshall Center and monitors the glovebox experiments performed on the International Space Station. (MSFC/Emmett Given)

The Marshall Space Flight Center-managed glovebox, also known as MSG, launched to the station during Expedition 5 on June 5, 2002, on space shuttle Endeavour. It is located in the U.S. laboratory, and allows crew members to participate in the assembly and operation of investigations in space similar to laboratories here on Earth.

"Because the work area is sealed and at negative pressure, astronauts can manipulate experiment hardware and samples without the risk of small parts, particulates, fluids or gasses escaping into the open," said Ginger Flores, the glovebox project manager in the ISS Payloads Office of the Science & Mission Systems Office. "This facility offers a 9-cubic-foot work area accessible to the crew through glove ports and to ground-based scientists through real-time data links and video."

The glovebox can conduct [a wide range of microgravity research](#), including fluid physics, combustion science, materials science, biotechnology, fundamental physics, and other investigations seeking to understand the role of gravity in basic physical and chemical interactions.

Once the crew sets up an experiment, the operations can often be done remotely from the ground, greatly increasing the productive use of the laboratory.

"This milestone is the perfect occasion to reflect on the success of the glovebox facility and the contributions of the team to a wide array of science experiments performed on station over the past nine years of glovebox operations," said Flores. "It is such a unique experience to work with payload developers from the beginning of design, to integrate and test their hardware right here at Marshall, and then support our astronauts as they operate that same experiment in space."

At the celebrated 10,000-hour mark, the glovebox was conducting the Capillary Channel Flow, or [CCF](#), investigation. "This experiment is a collaboration between NASA and the German Aerospace Center, and is designed to study critical velocities in open capillary flow under microgravity aboard the station," said Sharon Manley, investigation payload integration manager for Teledyne Brown Engineering, supporting the ISS Payloads Office. "One of the many possible applications of the experiment results is propellant management. The goal of this investigation is to enable design of spacecraft tanks that can supply gas-free propellant to spacecraft thrusters -- directly through capillary vanes -- greatly cutting cost and weight, while improving reliability."

The current design of spacecraft fuel tanks relies on additional reservoirs to prevent the ingestion of gas into the engines during firing. This research is needed to update these current models, which do not sufficiently predict the maximum flow rate achievable through the capillary vanes, eliminating the need to overdesign tanks.

Image right: The Marshall Center integrates and tests payloads in an identical engineering model of the Microgravity Science Glovebox to make sure hardware is working smoothly before it is sent to the International Space Station. (MSFC/Emmett Given)



"The glovebox has proven to be an extremely flexible multiuser facility," said Dr. Mark Weislogel, principal investigator for CCF at Portland State University in Oregon and designer of a set of capillary channels. "An open volume with essential levels of containment free up the investigator teams to design and construct either hand-operated or automated experiments of a wide range of sizes. The variety of experiments that can be performed is vast. The support from the MSG team is 24-7!"

The variety of the 23 investigations performed using the glovebox include the Shear History Extensional Rheology Experiment, known as [SHERE](#), which researched the effect of preshearing on the stress and strain response of a polymer fluid being stretched in microgravity. Conducted in 2008-2009 with follow-on studies in 2011-2012, this experiment was important for understanding containerless processing, an essential operation for fabrication of parts using elastomeric materials on future exploration missions.

From 2007 to 2010, scientists used the glovebox to burn spacecraft materials as part of the Smoke and Aerosol Measurement Experiment, or [SAME](#). This study measured smoke properties of particles from spacecraft fire smoke to provide data to support requirements for detection of smoke in space and to find ways to improve detectors in the future.



Additionally, a series of investigations studying complex fluids that are important for brake systems and robotics has been housed in the MSG. Named [InSPACE](#) -- short for Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions -- the experiments studied the particle dynamics of magnetorheological fluids -- fluids that change properties in response to magnetic fields.

Image left: Expedition 28 Flight Engineer Michael Fossum works with Shear History Extensional Rheology Experiment, or SHERE, hardware inside the Microgravity Science Glovebox on the International Space Station in August. (NASA)

"Reaching 10,000 operational hours for the MSG facility is a tremendous achievement," said Ed Bermea, MSG facility operations lead in the Space Systems Operations Branch of the Engineering Directorate. "The entire team is a close-knit

group, and the continual cooperation and hard work between the project office and the engineering disciplines is a large part of why this facility has operated well for so long. This operations team has shown extreme dedication through long hours, weekends and holidays. I am proud to be part of it."

The glovebox was developed by the European Space Agency. The three payloads, SHERE, SAME and InSPACE, are managed by NASA's Glenn Research Center. *Eagan, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.*

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NASA Gears Up for Second International 'Observe the Moon' Event

By Kim Newton

On July 20, 1969, two astronauts changed history by becoming the first humans to walk on the moon. Fast forward 42 years, and we still don't know nearly enough about the moon -- only 12 humans have explored six locations on the lunar surface. There are so many spectacular vistas on the lunar surface that no human has yet seen -- and equally spectacular scientific discoveries to be made.

Image right: A setting, waning crescent moon above the thin line of Earth's atmosphere. (Copyright Joby Minor. Used with permission, all rights reserved.)



On Oct. 8 from 5-8 p.m. CDT, NASA's Lunar Quest Program at the Marshall Space Flight Center and hundreds of enthusiasts around the world will come together for the second International "Observe the Moon" event.

It will include several hands-on activities for children and adults, including an inflatable planetarium show that will allow visitors to learn more about the moon and planets in our solar system. Several large amateur telescopes will be set up on the lawn for viewing the moon's surface in detail. Visitors can also take virtual 3-D trips to the moon aboard a specially equipped hands-on astronomy van, getting a magnified, command-module-like window view of the lunar surface.

International Observe the Moon Night is designed to engage the lunar science and education community, amateur astronomers, space enthusiasts and the general public, allowing them to share in the excitement of new discoveries in lunar science and space exploration.

Learn more about the International Observe the Moon event [here](#).

Prior to Saturday's event, Marshall planetary scientist Dr. Renee Weber will be available Oct. 6 from 2-3 p.m. CDT via web chat -- to answer questions about the moon and provide information about new and exciting lunar discoveries.

Go [here](#) to learn more about the web chat with Weber, or to participate on Oct. 6.

Weber serves as the project scientist for the Lunar Mapping and Modeling Project, a software project designed to provide lunar maps and surface feature information to mission planners and other lunar researchers. Her research focuses on

planetary seismology, in particular the reprocessing of seismic data from the Apollo missions. She is involved in several international efforts with goals of sending modern, broadband seismometers to both the moon and Mars.

Team members, learn more on ExplorNet.

Newton is a public affairs officer in the Office of Strategic Analysis & Communications.

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Hispanic Heritage Month 'Lunch and Learn' seminar features Glenn Center Director Ray Lugo



NASA's Glenn Research Center Director Ray Lugo spoke to Marshall Space Flight Center team members during the Hispanic Heritage Month "Lunch and Learn" seminar Sept. 29. Team members prepared a potluck lunch of traditional Hispanic dishes for attendees to enjoy. (MSFC/Fred Deaton)

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Army Cancels Vehicle Registration, Display of Decals

Redstone Arsenal news release

Team Redstone officials have announced that effective immediately, installation motor vehicle registration and the display of a vehicle decal are no longer required for Redstone Arsenal access.

The rules for proper identification have not changed. All current forms of identification are still required to access the post.

The arsenal's action aligns with a recent All Army Activities message from the Department of the Army's G-3, Operations section in the Pentagon. That message cancelled the requirement for motor vehicle registration and the display of decals in order to access Army installations. "Consistent with that policy change, we will no longer register vehicles or issue decals at Redstone Arsenal," said Garrison Commander Col. John Hamilton. "All privately owned vehicles must be licensed and insured in accordance with state and local laws. Rental vehicles are considered private vehicles for purposes of installation access, with the rental contract serving as license and insurance compliance."

Officials also noted that existing vehicle decals may continue to be displayed until the expiration date specified on the decal. Expired decals not removed by the vehicle owner will be removed by security personnel when entering the installation.

Of further note, based on unique security considerations, some Army and other service installations will continue to require vehicle registration. Registration for access to those installations must be conducted at those sites and will not be supported by Redstone Arsenal.

Questions pertaining to this change may be directed to the Redstone Arsenal Directorate of Emergency Services at 256-876-0766.

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Center Launches 'Marshall at Work' Web Presence

The Marshall Space Flight Center has launched a new external website, "[Marshall at Work](#)," to educate and inform stakeholders and members of the public about new developments at the Marshall Center. Users can browse updated center current events, milestones and accomplishments.



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Marshall Team Can Help Meet Local Educational Needs with Federal Impact Aid Program

By Amie Cotton

In September, Huntsville-area schools and Redstone Arsenal kicked off their annual Federal Impact Aid program to provide federal grant money to purchase school supplies, computers and other items necessary for enhanced learning. All Marshall Space Flight Center team members -- civil servants and contractors -- with school-age children can participate by taking a few minutes to fill out a Federal Impact Aid form.

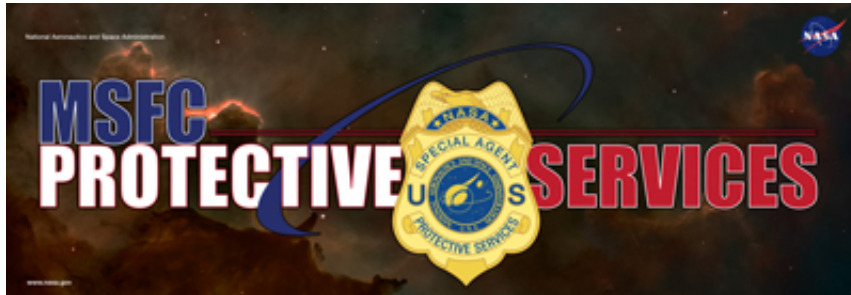
Federal Impact Aid is an annual program that provides federal grant money to local school districts financially burdened or impacted by federal populations. These federal populations must live or work on federal property. The funding is used by local school districts to meet a variety of unfunded requirements, including the hiring of additional educators.

"Since the 2005 announcement of the Base Realignment and Closure, or BRAC, area school districts -- including Huntsville, Madison City, Madison County and Arab -- have seen student populations increase by more than 6,500 students; local school districts have received nearly \$6 million in federal impact money," said Barbara Williams, U.S. Army Garrison's Education and School Liaison Officer at Redstone Arsenal.

"With the efforts of the Scottsboro school system during the last school year and the increasing support of Team Redstone organizations, the Scottsboro City Schools system was notified last month that it was approved to receive impact aid due to last year's submissions," said Williams. "We know that even though BRAC is officially complete, our communities and schools will continue to feel the effects of BRAC implementation."

Parents who do not receive a Federal Impact Aid form through their child's school can access a form [here](#).

Domestic Violence Awareness Month Briefings Available



October is Domestic Violence Awareness Month. To learn more about domestic or workplace violence, schedule a briefing for your organization's next safety or team meeting. For more information, please contact Diana K. Simpson, the Marshall Space Flight Center's Workplace Violence Prevention program coordinator, at 256-544-4767 or

diana.k.simpson@nasa.gov. For team members, briefings are offered by [Marshall Protective Services](#).

Domestic Violence Awareness Month evolved from the national "Day of Unity" in October 1981, conceived by the [National Coalition Against Domestic Violence](#). The intent was to connect advocates across the nation who were working to end violence against women and children. The Day of Unity soon became an entire week devoted to a range of activities conducted at the local, state and national levels.

Learn more about Domestic Violence Awareness Month [here](#).

Find this article at:

<http://www.nasa.gov/centers/marshall/about/star/index.html>